

IN THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

Claim 1 (Previously Amended): A method comprising:

providing a glass work piece with an inner cut and an outer cut formed therein, the portion of the work piece outside said outer cut constituting an outer waste piece, the portion of said work piece inside said inner cut constituting an inner waste piece, the portion of said work piece between said inner and outer cuts constituting a middle portion of said work piece;

heating the middle portion and cooling the inner waste piece including the sub-steps of,

placing said middle portion proximate to but not in contact with a surface of a heating element,

placing a cooling element against the inner waste piece, and

lifting the inner waste piece relative to the middle portion to thereby separate the inner waste piece from the middle portion; and

separating the inner waste piece from the middle portion.

Claim 2 (Original): Method of claim 1 wherein said cuts are provided in said work piece prior to said heating of the outer waste piece, said cuts extending through the entire thickness of said work piece.

Claim 3 (Original): Method of claim 1 wherein said inner and outer cuts are provided by applying a laser to said work piece, said cuts extending through the entire thickness of said work piece.

Claim 4 (Original): Method of claim 1 wherein said heating the outer waste piece is accomplished by placing said outer waste piece against a heating plate.

Claim 5 (Original): Method of claim 4 further comprising:
gripping said inner waste piece with a vacuum grip after said heating of said outer waste piece; and

raising said inner waste piece to thereby separate the inner waste piece and middle portion from said outer waste piece.

Claim 6 (Cancelled).

Claim 7 (Original): Method of claim 1 further comprising depositing a magnetic layer on the middle portion after the middle portion has been separated from the inner and outer waste pieces.

Claim 8 (Original): Method of claim 7 further comprising forming an underlayer between the middle portion and the magnetic layer, and forming a protective overcoat over the magnetic layer.

Claim 9 (Original): Method of claim 1 wherein said heating the outer waste piece comprises:

placing said outer waste piece against a heating element, said heating element comprising one or more channels formed therein; and

applying a vacuum to said one or more channels to hold said outer waste piece against said heating element.

Claim 10 (Original): Method of claim 1 wherein said outer cut circumferentially surrounds said middle portion.

Claim 11 (Original): Method of claim 1 wherein the temperature difference between the middle piece and the waste piece that said middle piece is being separated from during said separating is greater than about 100°C.

Claim 12 (Original): Method of claim 1 wherein the temperature difference between the middle piece and the waste piece that said middle piece is being separated from during said separating is greater than about 125°C.

Claim 13 (Original): Method of claim 1 wherein the temperature difference between the middle piece and the waste piece that said middle piece is being separated from during said separating is greater than about 150°C.

Claim 14 (Original): Method of claim 1 wherein said middle piece is subjected to a temperature cycle less than about 200°C during said method.

Claim 15 (Original): Method of claim 1 wherein said middle piece is subjected to a temperature cycle less than about 150°C during said method.

Claim 16 (Original): Method of claim 1 wherein said middle piece is subjected to a temperature cycle less than about 125°C during said method.

Claim 17 (Currently Amended): Method comprising:
providing a glass work piece that surrounds a waste piece;
heating the glass work piece using a heating element ~~having~~ comprising a fixed heating surface which heats the glass work piece without mechanically contacting the major surfaces of said work piece;
cooling the waste piece, wherein the waste piece contracts relative to the work piece, and the work piece expands relative to the waste piece; and
separating the work piece from the waste piece.

Claim 18 (Original): Method of claim 17 wherein the temperature difference between the work and waste pieces is greater than about 100°C during said separating.

Claim 19 (Original): Method of claim 17 wherein the temperature difference between the work and waste pieces is greater than about 125°C during said separating.

Claim 20 (Original): Method of claim 17 wherein the temperature difference between the work and waste pieces is greater than about 150°C during said separating.

Claim 21 (Original): Method of claim 17 wherein said work piece is subjected to a temperature cycle less than about 200°C during said method.

Claim 22 (Original): Method of claim 17 wherein said work piece is subjected to a temperature cycle less than about 150°C during said method.

Claim 23 (Original): Method of claim 17 wherein said work piece is subjected to a temperature cycle less than about 125°C during said method.

Claim 24 (Currently Amended): Method comprising:
providing a work piece comprising a crack extending all the way through the thickness of the work piece, said crack having a closed shape such that the crack surrounds a first portion of said work piece and is surrounded by a second portion of said work piece, causing a temperature differential between said first and second portions subsequent to the providing step such that the first portion has a greater temperature than the second portion, thereby facilitating the separation of the first and second portions,
wherein the temperature difference between the work and waste pieces is greater than about 100°C.

Claim 25 (Original): Method of claim 24 wherein said causing comprises heating said second portion.

Claim 26 (Original): Method of claim 24 wherein said causing comprises cooling said first portion.

Claim 27 (Original): Method of claim 24 wherein said causing comprises heating said second portion and cooling said first portion.

Claim 28 (Original): Method of claim 24 wherein said first portion is disk shaped.

Claim 29 (Original): Method of claim 24 wherein said second portion is disk shaped.

Claim 30 (Cancelled):

Claim 31 (Original): Method of claim 24 wherein the temperature difference between the work and waste pieces is greater than about 125°C.

Claim 32 (Original): Method of claim 24 wherein the temperature difference between the work and waste pieces is greater than about 150°C.

Claim 33 (Original): Method of claim 24 wherein said work piece is subjected to a temperature cycle less than about 200°C during said step of causing a temperature difference.

Claim 34 (Original): Method of claim 24 wherein said work piece is subjected to a temperature cycle less than about 150°C during the step of causing a temperature difference.

Claim 35 (Original): Method of claim 24 wherein said work piece is subjected to a temperature cycle less than about 125°C during the step of causing a temperature difference.

Claim 36 (Currently Amended): Method comprising:

providing a temperature difference between a product piece and a waste piece so that said waste piece and product piece can be moved relative to one another, said product piece including a data recording surface;

moving at least one of said product piece or said waste piece so that said moved product piece or waste piece is close enough to a vacuum chuck so as to be held by the vacuum chuck; and

causing said vacuum chuck to hold at least one of said moved product piece or waste piece without physically contacting the data recording surface of the product piece.

Claim 37 (Original): Method of claim 36 wherein said vacuum chuck comprises two vacuum channels that are displaced from one another so that said vacuum chuck can hold both the product piece and the waste piece while the product and waste pieces are displaced relative to one another.

Claim 38 (Original): Method of claim 37 further comprising using said vacuum chuck to transport the waste and product pieces after the waste and product pieces are displaced from one another.

Claim 39 (Original): Method of claim 36 wherein the product piece is a glass substrate.

Claim 40 (Previously Amended): Method comprising:
providing a work piece and a waste piece;
placing one of the waste piece or the product piece adjacent to a temperature element, said temperature element changing the temperature of the adjacent waste piece or product piece so that the waste piece and produce pieces can be displaced relative to one another; and
moving the adjacent waste piece or product piece by moving the temperature element in order that the waste and product pieces are displaced relative to one another.

Claim 41 (Original): Method of claim 40 wherein said placing comprises placing the waste piece over the temperature element.

Claim 42 (Original): Method of claim 40 wherein the product piece is a substrate.

Claim 43 (Original): Method of claim 40 wherein the temperature element is a cooling element.

Claim 44 (Original): Method of claim 40 wherein said moving the temperature element comprises lifting the temperature element while the waste piece rests on the temperature element.

Claims 45-47 (Cancelled).

Claim 48 (Withdrawn) Apparatus comprising:
a hot plate for heating a work piece; and
a vacuum channel extending to a surface of said hot plate for holding said work piece flush against said hot plate.

Claim 49 (Withdrawn) Apparatus of claim 48 wherein said hot plate only heats a portion of said work piece at the periphery of said work piece but not a centrally located portion of said work piece.